

Pocasset Harbor Subwatershed

Bourne, Cape Cod, Massachusetts

The Pocasset Harbor Subwatershed is located in Bourne with its easternmost portion in Sandwich. It has an area of 4,596 acres.

The Pocasset Harbor system is composed of four smaller harbors: Red Brook Harbor, Hen Cove, Pocasset Harbor, and Barlow's Landing. Pocasset Harbor has shallow margins, but maintains a two-meter channel with depths of seven meters in the channel between Bassett's Island and Wing's Neck. Most of the eelgrass is located in the shallower inner harbor region and bordering the main deep channel to the mouth. The beds are moderate in coverage.

According to The Coalition of Buzzards Bay Baywatchers II report, Red Brook Harbor is one of the least developed watersheds in Buzzards Bay. The harbor itself has 14 acres of fringing salt marsh and has lost its eelgrass beds in recent years. The harbor is heavily used for recreation with 352 slips and moorings and two marinas that both have pump-out facilities. The Red Brook Harbor subwatershed contains 92 acres of cranberry bogs.

Groundwater samples were collected from beneath Red Brook Harbor by the U.S. Geological Survey in the summer of 2000. Chemicals present in the Landfill 1 (LF-1) plume from the Massachusetts Military Reservation were detected in these samples (at concentrations below drinking water standards). This led USGS scientists to conclude that portions of the LF-1 plume may discharge into the harbor. Although the landfill is now capped and the upper portion of the plume is slated for remediation, the lower portion of the plume will continue to contribute to the Harbor for many years.

In contrast, Hen Cove is one of the most densely developed watersheds in Buzzards Bay with an average of 1.1 units per acre. The ninety-four acres that are not residentially developed make up the Pocasset Golf Club. Water quality in the Cove is fair to moderate. The small freshwater pond at the head of the harbor contributes high levels of fecal coliform bacteria to the system. The harbor has blooms of algae and macrophytes. There are approximately five acres of salt marsh and much of the upper watershed is still forested within the Massachusetts Military Reservation. It is estimated that additional development and the conversion of seasonal homes to year round could increase nitrogen loads by 25%. The Cape Cod Commission, ranking 14 out of 52 embayments, has designated Hen Cove and the greater complex as nitrogen sensitive. The cove has over 100 moorings and slips, a well-used public beach, private beaches, and a boat launch. The cove supports productive shellfish habitat, but shellfishing in the inner cove is prohibited due to poor water quality from bacterial contamination. The cove has apparently lost much of its eelgrass, which may be an indicator of declining water quality.

The Acid Rain Monitoring Project by the University of Massachusetts-Amherst (2001) studied Red Brook Pond. Samples are taken three times a year, in April, July, and October. The Acid Neutralizing Capacity of the pond was found to be in the "highly sensitive" range, meaning that the aquatic environment is highly sensitive to acid deposition.

The Pocasset Harbor is one of the most improved embayments in Buzzards Bay. Stormwater remediation efforts in 1995-1997 are the likely cause of the significant increases in water quality, which was at one time the worst on the eastern shore of Buzzards Bay. The Harbor boasts a significant area of tidal wetlands and two small marsh islands. Because of the tidal exchanges that occur between all three waterbodies in this system, the other two embayments in the system are the largest potential sources of "new nitrogen" to the Harbor.

According to Division of Marine Fisheries Sanitary Surveys, Wings Neck Creek leading into Barlows Landing may contain high levels of nutrients.

The town has a municipal water system, but there are no public sewers in this subwatershed. In Spring 2002, three of the Town of Bourne's six public water supply wells were closed due to contamination from the Massachusetts Military Reservation. Traces of the chemical perchlorate, used in explosives, were found in them. The Town decided to join the Upper Cape Water Supply Cooperative to make up for the projected water shortfalls. The military funded a pipeline, completed in 2002, that links the Bourne district water main to the Upper Cape Water Supply.

The new Cape Cod jail will be located on the Massachusetts Military Reservation in this subwatershed. Construction began in 2002 and lasted 18 months. The facility will have a wastewater hookup to the Otis sewerage treatment plant.

Stewards:

- The Coalition for Buzzards Bay (www.savebuzzardsbay.org)
- Cataumet Civic Associates

Studies conducted in the watershed:

- Flushing study. 1997. Buzzards Bay Project National Estuary Program.
- Baywatchers II. Nutrient related water quality of Buzzards Bay embayments: a synthesis of Baywatchers monitoring 1992-1998. The Coalition for Buzzards Bay. December 1999.
- Groundwater samples were collected from beneath Red Brook Harbor by the U.S. Geological Survey in the summer of 2000.
- Acid Rain Monitoring Project by the University of Massachusetts-Amherst, 2001 sampled Red Brook Pond. Samples are taken three times a year, in April, July, and October.
- Atlas of Tidally Restricted Salt Marshes – Buzzards Bay Watershed, Massachusetts. Buzzards Bay Project National Estuary Program. 2002.
- Atlas of Stormwater Discharges in the Buzzards Bay Watershed, Final Draft. June 2002. Buzzards Bay Project National Estuary Program.
- Detection of Fresh Ground Water and a Contaminant Plume beneath Red Brook Harbor, Cape Cod, Massachusetts, 2000. 2002. United States Geological Survey.
- The Red Brook Harbor/Pocasset Harbor/Hen Cove system was selected as a priority area for Year 2 of the Massachusetts Estuaries Project, funded by the state and UMass Dartmouth. The goal of the project is to develop critical nutrient loading thresholds for each embayment to aid in water resources planning. This will support federal requirements for the development of Total Maximum Daily Loads for impaired surface waters. This area will be evaluated in 2003.

Who is collecting water quality data and where:

- The Coalition for Buzzards Bay – Baywatchers. Sample for temperature, water clarity, salinity, dissolved oxygen, chlorophyll a, nitrogen, and phosphorus.
- Cataumet Civic Associates - Red Brook Harbor. Sample 4 times/year for physical parameters, nitrate-nitrogen, ammonia-nitrogen, phosphate, copper, and sulphur.

Management actions taken:

- Rapid Infiltration Structures for three discharges to Hen Cove. 1992.
- Landfill was capped. The upper portion of the plume is slated for remediation.

- Stormwater remediation has been done at Barlow's Landing Road.
- Because of a groundwater plume emanating from the Massachusetts Military Reservation, the Air Force Center for Environmental Excellence (AFCEE) entered into an agreement with the Bourne Water District to pay for the entire cost of connecting residences in the Scraggy Neck area to municipal water in 2001.
- Barlow's Landing Salt Marsh Restoration Project. Town of Bourne, Massachusetts Wetlands Restoration Program, and the U.S. Fish and Wildlife Service partnered on this project to restore 13 acres of salt marsh by replacing a 48" culvert with an 8' box culvert to restore tidal flow and alleviate ponding of water that caused marsh deterioration. Project cost \$31,000, completed in 1998.
- Wings Neck Salt Marsh Restoration Project. \$110,000 project cost, contributed by town, state, federal government, private organizations, and corporate donors through the Massachusetts Wetlands Restoration Program in 2002. Enhanced tidal flow by replacing a 24" culvert with two 3'x4' culverts, restoring eight acres of salt marsh.
- In Spring 2002, the Town of Bourne decided to join the Upper Cape Water Supply Cooperative after three of its six public water supply wells were closed due to contamination from the Massachusetts Military Reservation. The military funded a pipeline, which was completed in June 2002, linking the Bourne district water main to the Upper Cape Water Supply.

Subwatershed facts: (For data sources see appendix)

- 21 E sites: 2 on the Massachusetts Military Reservation
- Solid waste sites: none
- Zone IIs located in this watershed: 1
- Percent of the undeveloped land that is currently protected (according to 1985/1990 data): 33.6%
- Acres of existing wetlands: 122
- Certified vernal pools: none
- Named freshwater ponds & lakes: Lily, Main Gate, Red Brook, Long, Cuff's, Picture Lake
- Named rivers and creeks: none
- Shellfish growing areas: Inner portion of Pocasset Harbor - conditionally approved for shellfish harvesting. Hen Cove – prohibited. Inner portion of Red Brook Harbor – conditionally approved. Barlow's Landing – seasonal closure at end of Barlow's Landing. Kingman Marine – closed to shellfishing due to presence of marina. The rest of Pocasset Harbor is open.
- Beach Closings: Patuisset Beach was closed to swimming for at least one day during the 2001 season due to high enterococcus bacteria counts.

Priorities:

- Implement BMP on stormdrain off of Route 28 draining into Red Brook and stormdrain on Route 28, draining to Flax Pond. Work with Massachusetts Highway Department to correct. (NRCS)
- Main Gate, Picture, and Red Brook Ponds need volunteers to participate in the Pond and Lakes Stewardship Project (PALS), measuring water quality and other characteristics of the ponds.
- Examine road runoff and flow from small pond at Island Drive for impacts to Hen Cove.
- Conduct Hen Cove Salt Marsh Restoration Project.
- Identify source of pollution into Wing's Neck Creek and Barlow's Landing.
- Acquire open space. Parcels considered a priority for acquisition for water supply development and protection: Bourne Tracts 5, 9, 10, 15, 16, 18, 22, 23, and 30 were ranked as having medium or

high water supply development potential in the Cape Cod Commission's *Priority Land Acquisition Assessment Project* (April 1999). These tracts are located throughout the Town of Bourne.

- Implement those salt marsh restoration projects identified in the 2002 *Atlas of Tidally Restricted Salt Marshes – Buzzards Bay Watershed, Massachusetts* that have been evaluated and prioritized by the town. Sites in this subwatershed are BN25, BN13, BN17, BN24, BN27, and BN21.

The following priorities appeared in The Coalition for Buzzards Bay Baywatchers II Report:

- Implement nutrient management measures for on site septic systems in Red Brook Watershed to mitigate effects of LF-1 plume.
- Install vegetated swales or engineered wetlands to prevent further loading to Hen Cove from stormwater.
- Town, marinas, and Harbor Master should encourage boat owners by the to make use of the pump-out facilities in Red Brook Harbor.
- Implement BMPs minimizing nitrogen inputs to the harbor from cranberry agriculture.

Recreation:

Camping areas: none

Golf courses:

- Pocasset Golf Club

Pathways and trails:

- Nivling-Alexander Reserve, DeNormandie Woods Conservation Area, Broyer and Robinson Conservation Area
- www.capecodcommission.org/pathways/trailguide.htm

Public access:

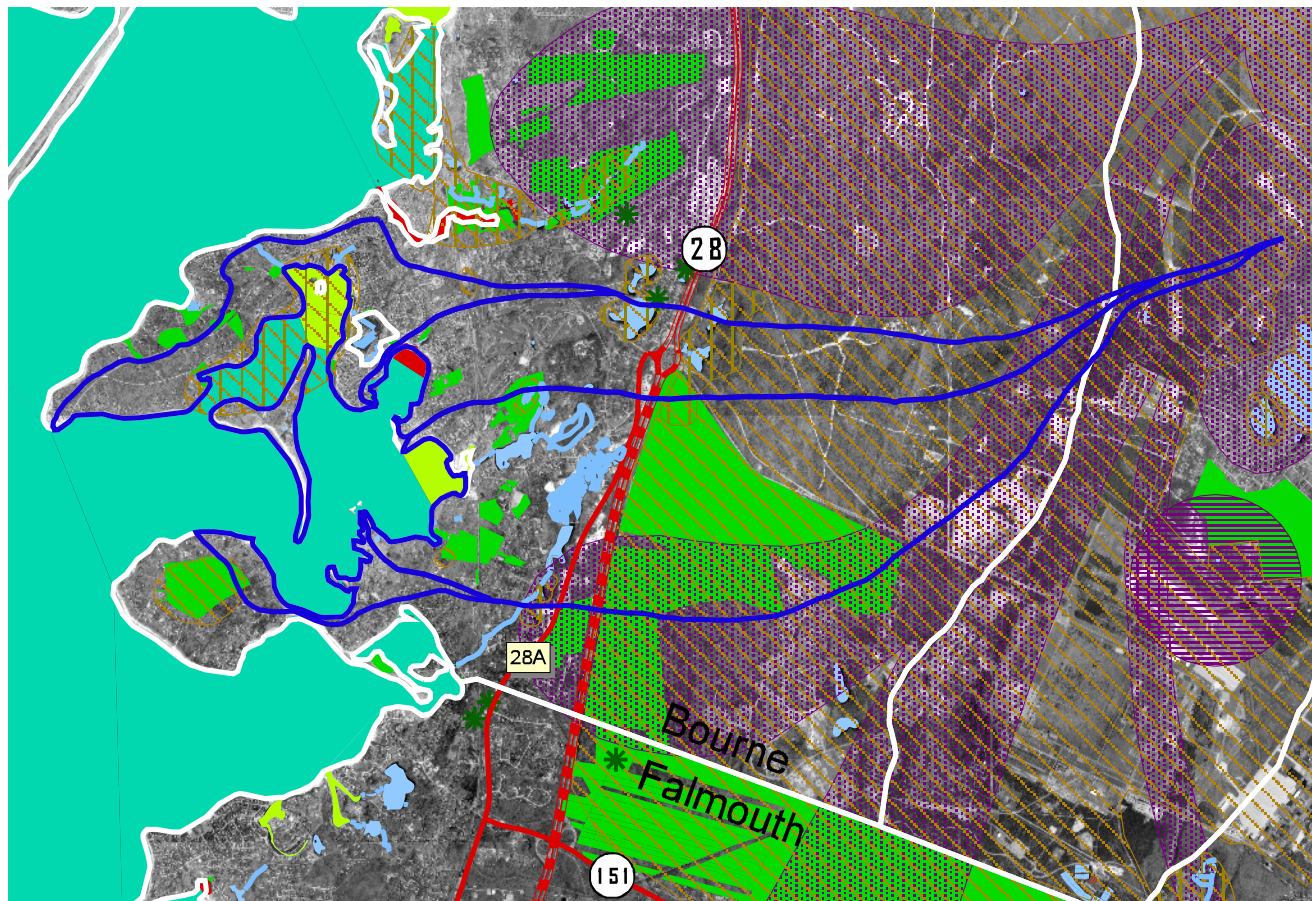
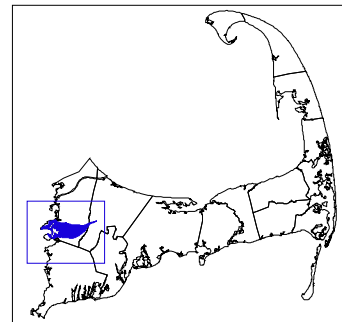
- www.state.ma.us/dfwele/pab/pabSEmap.htm

Public beaches and landings:

- 3 landings
- Approximately 1,245 moorings and slips
- Beaches at Barlow's Landing, Hen's Cove, and Picture Lake
- Merriam Beach

Pocasset Harbor

Bourne, MA



Watershed Resources



1 0 1 Miles

Natural Heritage and Endangered Species Program Data

- Certified Vernal Pool
- Priority Habitats of Rare Species
- Estimated Habitats of Rare Species

Groundwater Protection Areas

- Interim Wellhead Protection Area
- Zone II
- Solid Waste Facility

Watershed Boundary

Anadromous Fish Run

Shellfish Growing Areas

- APPROVED
- CONDITIONALLY APPROVED
- MANAGEMENT CLOSURE
- PROHIBITED
- RESTRICTED

Open Space

Streams

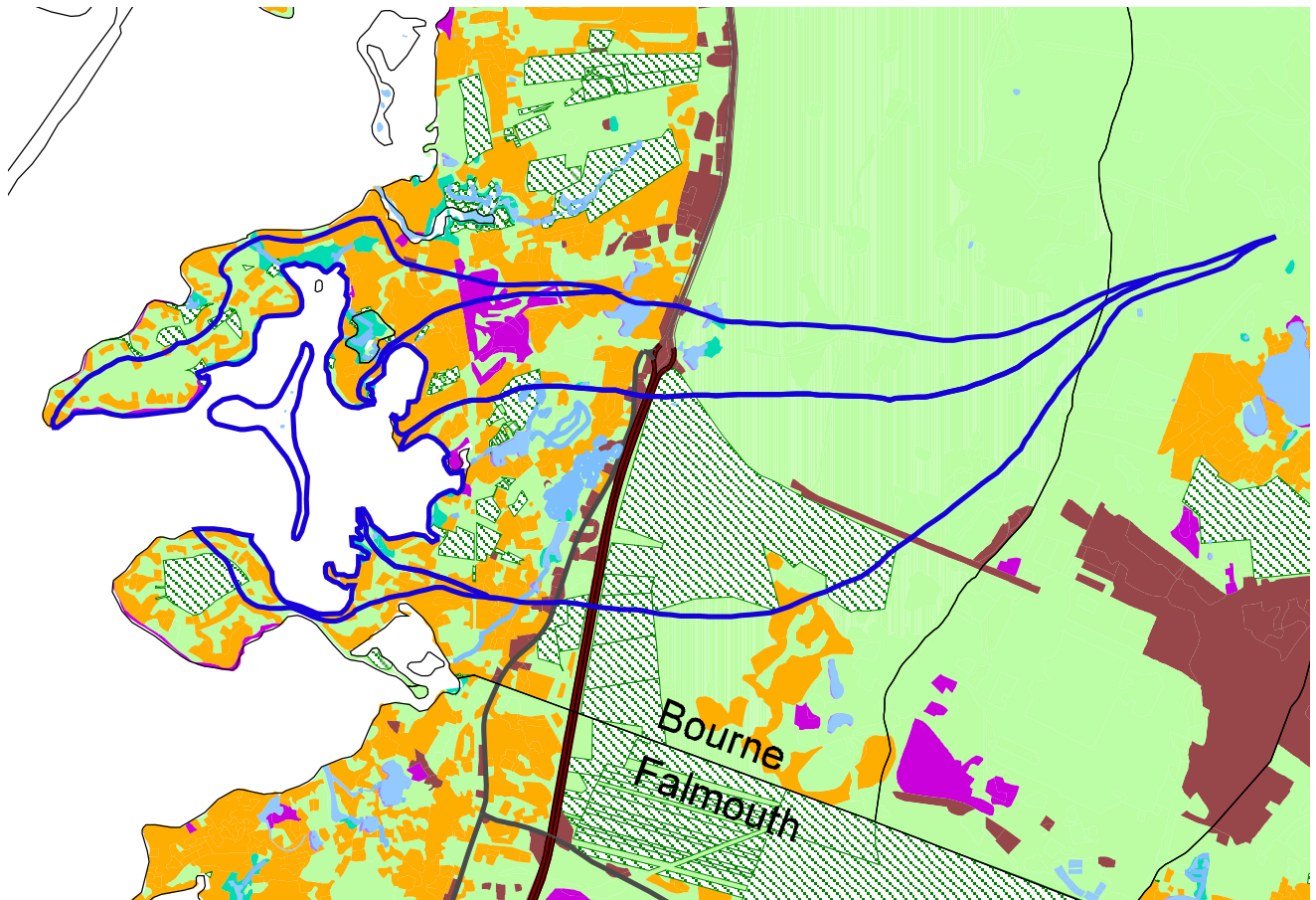
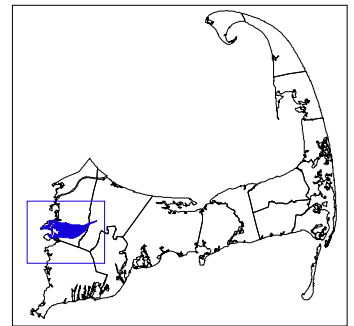
Ponds

Roads



Pocasset Harbor

Bourne, MA



Land Use



1 0 1 Miles

A scale bar with markings for 1, 0, and 1 mile.

Land Use

- non-residential developed
- open land
- recreation
- residential
- water
- wetland
- Streams
- Ponds
- Watershed Boundary
- Protected Open Space

